PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissi ner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 30 October 2001 (30.10.01)	
International application No. PCT/GB01/00035	**Applicant's or agent's file reference** XA1344
International filing date (day/month/year) 05 January 2001 (05.01.01)	**Priority date** (day/month/year) 11 January 2000 (11.01.00)
Applicant ALDRIDGE, Nigel, Bruce et al	

1. The designated Office is hereby notified of its election made:

   [X] in the demand filed with the International Preliminary Examining Authority on:

   01 August 2001 (01.08.01)

   [ ] in a notice effecting later election filed with the International Bureau on:

   _____

2. The election [X] was

   [ ] was not

   made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Olivia TEFY
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
XA1344		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB01/00035	05/01/2001	11/01/2000
International Patent Classification (IPC) or national classification and IPC G02B6/43		
Applicant BAE SYSTEMS PLC et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
01/08/2001	07.02.2002
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Riblet, P Telephone No. +49 89 2399 2424

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB01/00035

I. Basis f the r port

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

2,4,5,7-16	as published			
1,3,3a,6	as received on	22/01/2002	with letter of	16/01/2002

Claims, No.:

1-11	as received on	22/01/2002	with letter of	16/01/2002

Drawings, sheets:

1/6-6/6	as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☒ the claims, Nos.: 12-29
- ☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)
   see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-11
	No:	Claims	
Inventive step (IS)	Yes:	Claims	4,6-7, 11
	No:	Claims	1-3, 5, 8-10
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

2. Citations and explanations
   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

R It m I

Basis of the report

The following amendment in the description p.1 'and so the phrase 'embedded within a composite' should be taken to include a position within a composite that contains a passageway for accessing the article' is not admissible because it was not originally disclosed in the description (Article 34(2)(b) PCT).

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made of the following documents:
D1: GB2322479A (Advantest Corp.) 26 August 1998
D3: US-A-4465333 (Caserta et Al.) 14 August 1984, added in the enclosure

1. The subject-matter of **independent claim 1**, as far as understandable (see VIII.1), and consequently of its **dependent claims 2-11** is novel (Article 33(2) PCT) since none of the cited documents discloses a composite aircraft panel comprising an optical transmission means and a collimating means completely embedded within a carrier.

2. The subject-matter of **independent claim 1**, as far as understandable (see VIII.1), lacks an inventive step (Article 33(3) PCT) for the following reasons:
Document D1 describes an electro-optical hybrid wiring board panel (see p.3, l.20) comprising:

(a) an optical transmission means (25F1) and an optical processing means (26) optically connected to the optical transmission means for processing light to or from the optical transmission means, both the optical transmission means and the optical processing means being embedded within a carrier (see Figs.8-9 and p.9, l.15 to p.10, l.7, p.11, l.23-26 as well as Fig.5), wherein the optical processing means comprises means (26A) for collimating a light beam (see Fig.9 and p.15, l.11-18), and
(b) a 'high quality' optical interface surface (S1) provided within the carrier for connection with the optical transmission means, the optical interface surface

providing a means for optical connection to the transmission means from outside the carrier (see Figs.8-9 and p.15, l.1-4).

In D1 the collimating means is not completely embedded within the carrier and has a surface at the same level as the exterior surface of the carrier (see Fig.9). However, the skilled person would position the collimating means (26A) as a normal design option completely within the passageway in order to better collect the beam exiting from the optical fibre in case of a too strong beam divergence exiting from the optical fibre or in an embodiment as disclosed in Fig.12 where some place is provided in the passageway to put a lens next to the optical fibre. Such modification does not appear to involve an inventive step.

It is further noted that D1 describes an electro-optical hybrid wiring board panel which is not specifically intended to be used in a composite aircraft panel. However, such board panels of very similar design are known to be used in an aircraft as exemplified in D3 (see the abstract, col.1, l.42-61 and the figures) because it enables to maximize the 'avionic packaging density' (see in D3, col.3, l.10-12). It results that such circuit board panel as disclosed in D1 is also suitable to be integrated in an aircraft panel by simple adaptation of size and composite material suitable in aircraft panel design.
As a consequence, it is considered that the subject-matter of claim 1 does not involve an inventive step.

3. The subject-matter of **dependent claims 2, 5 and 9** lacks an inventive step (Article 33(3) PCT) for the same reasons as given in V.2 since the features of said claims are known from D1:
Claim 2: in D1 a passageway (24A) is formed within the carrier to the embedded optical transmission means (see Fig.8 and p.11, l.23-26);
Claim 5: in D1, the ends of the optical fibre (25F1) have a reflective surface (see p.10, l.8-9) which are detectable from the outside and thus suitable to be used as a locating means or an embedded detectable position marker within the composite;
Claim 9: see in D1, the different embedded processing means in Figs.8-12 and corresponding descriptions such as the reflective surface of the fibre, the use of a lens (26A) and a prism (26C);

3. The subject-matter of **dependent claims 3, 8 and 10** lacks an inventive step (Article 33(3) PCT) for the same reasons as given in V.2 and since it results in normal alternative design options in the composite device according to D1:
Claim 3: D1 does not specify the use of a protective plug being removable prior to forming an optical connection. However, the skilled person would use such a protection as an obvious option when the optical connection should be realised a long time after realising the passageway in the composite;
Claim 8: D1 does not specify whether the optical fibre comprises an expanded core portion. However, such fibres (with their advantages) are well-known in this field and their use does not involve an inventive step;
Claims 10: D1 discloses the use of a cylindrical condensing lens (see p.15, l.13-15). However the skilled person would use other known equivalent lenses such as a graded index lens without involving an inventive activity.

4. The subject-matter of **dependent claim 4** and consequently of its **dependent claims 6 and 7** (see also VIII.3) involves an inventive step (Article 33(3) PCT) since none of the cited documents discloses nor suggests alone or in combination the use of a means for preventing laser irradiation from being optically coupled with the optical transmission means present in an aircraft panel or a circuit board panel.

5. The subject-matter of **dependent claim 11** involves an inventive step (Article 33(3) PCT) since none of the cited documents discloses nor suggests alone or in combination the use of a D-fibre as the optical transmission means present in an aircraft panel or a circuit board panel.

6. In view of the cited prior art documents, the industrial applicability (Article 33(4) PCT) is clearly given for the subject-matter of all the claims.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.

2. Independent **claim 1** is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

3. The features of **claims 1-11** are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

4. The vague and imprecise statement in the description on page 16, l.27 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3a).

Re Item VIII

Certain observations on the international application

1. The subject-matter of **independent claim 1** is not clear (Article 6 PCT) for the following reasons:
   (a) The expression 'embedded within a carrier' does not necessary means that the transmission means and optical processing means should be located completely within the carrier. This is in contradiction with the definition of such expression given in the description p.1, l.10-14. In the section V above, it will be interpreted nevertheless according to the description, i.e. that the transmission means and optical processing means are completely embedded within a carrier.
   (b) The expression 'high-quality optical interface' is relative and does not have a well-recognized meaning. In the section V above, it will be interpreted according to the description p.4, l.2-6. Moreover it is noted that the claims should be clear in themselves and no reference to the description, except for reference sign and when absolutely necessary (Rule 6(2)(a) PCT), should be done.

2. **D p ndent claims 2-11** are not referring to the same device as the parent claim 1, rendering thereby the subject-matter of said claims unclear (Article 6 PCT).

3. **D p nd nt claim 7** refers to claim 6 as dependent from any of claims 2 to 5. However, claim 6 does not depend on claims 2, 3 or 5 (as dependent on claims 2 or 3). In section V above it will be considered that claim 7 refers to claim 6 (which depends only on claim 5 as dependent on claim 4).

XA1344

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 July 2001 (19.07.2001)

PCT

(10) International Publication Number
WO 01/51976 A1

(51) International Patent Classification[7]: G02B 6/43, 6/12

(21) International Application Number: PCT/GB01/00035

(22) International Filing Date: 5 January 2001 (05.01.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0000405.1 11 January 2000 (11.01.2000) GB

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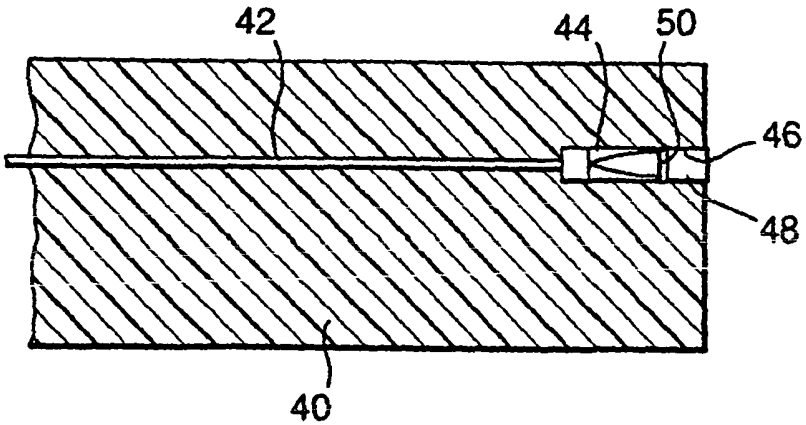
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

[Continued on next page]

(54) Title: IMPROVEMENTS RELATING TO INTERFACING OPTICAL TRANSMISSION STRUCTURES



(57) Abstract: A composite (40) for use in the aircraft construction industry comprise an optical transmission means (42), such as an optical fiber, embedded within a carrier. The optical transmission means is provided with a high-quality optical interface surface (50) which provides a means for optical connection to the optical transmission means (42) from outside the carrier. The optical interface surface (50) is provided as part of a micro-optical component (44) which processes the optical signals to improve light extraction from and supply to the optical transmission means (40). The buried optical transmission means is accessed by a passageway (56, 66) formed in the carrier to the interface surface (50). If the passageway (56, 66) is formed prior to completion of finishing processes on the composite, a protective plug (48) is provided to close the passageway (56, 66) until the optical connection is required.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.